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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/883,949	06/20/2001	Hideobu Hamada	2001_0776A	2657

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WASHINGTON, DC 20006-1021

EXAMINER
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RAHLL, JERRY T

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 02/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/883,949

Applicant(s)

HAMADA, HIDENOBU

Examiner

Jerry T Rahll

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Applicant's Election received 25 July 2003.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.  
4a) Of the above claim(s) 36-53 is/are withdrawn from consideration.  
5) ☒ Claim(s) 1-5, 8-12 and 35 is/are allowed.  
6) ☒ Claim(s) 6, 7, 13-17 and 34 is/are rejected.  
7) ☒ Claim(s) 18-33 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 20 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 06-2003.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

2. The drawings submitted have been reviewed and determined to facilitate understanding of the invention. The drawings are accepted as submitted.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 6,7 and 13-17 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. patent No. 6,075,915 to Koops et al.
5. Koops et al. describes a method of fabricating a photonic crystal, comprising the step of forming the photonic crystal (11) by making, in a predetermined section along fiber composed of a core (14) through which light propagates and a clad surrounding the core, a plurality of columns (16, 20) penetrate through said core (see Figures 1-2 and Col 2 Ln 46- Col 3 Ln 58). Kops et al. further describes partially removing said clad in said predetermined section from said optical fiber to form at least one plane parallel to said optical axis (to from the D profile fiber

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described by Koops et al.) and forming, perpendicularly to said plane formed in said removing step, a plurality of holes penetrating said core.

6. Further, Koops et al. describes an optical device structured by forming a photonic crystal (11) on an optical fiber composed of a core (14) through which light propagates and a clad surrounding the core, comprising: at least one functional part formed as said photonic crystal with a plurality of columns (16, 20) penetrating through said core in a predetermined section of said optical fiber along an optical axis of said optical fiber; and a propagation part for propagating the light as a function of said optical fiber. Koops et al. further describes the functional parts formed by the plurality of columns (26, 20) parallel to each other and periodically distributed on a plane perpendicular to a longitudinal direction of said columns. Koops et al. further describes the plurality of columns forming the functional part penetrate through said core and said clad of said optical fiber.

7. While Koops et al. does not specifically state the plurality of columns forming the functional part having a refractive index different from a refractive index of material forming the core, the columns described must have a refractive index different from a refractive index of the core in order to function as a photonic crystal. If the refractive indices were the same, the device described by Koops et al. would not function as a filter.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koops et al. as applied to claim 13 above, and further in view of U.S. Patent No. 4,676,588 to Bowen et al.

10. Koops et al. describes an optical device, as discussed above. Koops et al. does not specifically describe a guide for surrounding an optical fiber. Bowen et al. describes a cylindrically shaped guide (10) for surrounding an optical fiber with a diameter (26) approximately equal to a diameter of a ferrule of another optical fiber connected to the optical fiber (see Figures 1-4 and Columns 1-3).

11. Koops et al. and Bowen et al. are analogous art because they are from the same field of endeavor of optical fibers and optical signal transmission. At the time of invention, it would have been obvious to one of ordinary skill in the art to use the connector of Bowen et al. to connect the fiber systems of Koops et al. with another optical fiber. The motivation for doing so would be to use the processed signal from the Koops et al. system with further optical components by transmitting the signal through another optical fiber. Therefore, it would have been obvious to combine Bowen et al with Kops et al. to obtain the invention as described in Claim 34.

***Allowable Subject Matter***

12. Claims 1-5, 8-12 and 35 are allowed.

13. Claim 18-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. Claims 1-5 and 8- 12 describe forming a photonic crystal directly on an end surface of at least one optical fiber.

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15. Claims 18-19 describe the columns formed of a material having a Faraday effect.
16. Claims 20-28 describe the plurality of columns made of material having an electro-optic effect.
17. Claims 29-32 describe the functional part plurally provided along the optical axis of the optical fiber at predetermined intervals.
18. Claim 33 describes the photonic crystal having a predetermined refractive index and state of distribution to have a wavelength dispersion characteristic of recovering a waveform of the light to be a steep waveform for output.
19. Claim 35 describes an optical device having first and second optical fibers formed with a plurality of holes penetrating through the core where the longitudinal direction of the holes of the first fiber forms an angle of 45° with a longitudinal direction of the holes in the second fiber.
20. This is subject matter not described or reasonably suggested by the prior art of record.

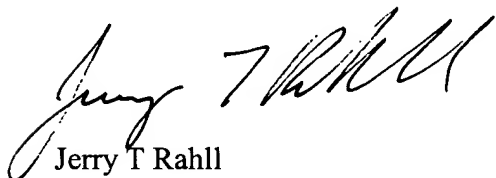
### ***Conclusion***

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents Nos. 5802236, 6301421, 6334019, 6470127 and 6552820 describe photonic elements formed in optical fibers.
22. Prior art documents submitted by applicant in the Information Disclosure Statement filed on 09 June 2003 have all been considered and made of record (note the attached copy of form PTO-1449).
23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry T Rahll whose telephone number is (571) 272-2356. The examiner can normally be reached on M-F (8:00-5:30), with alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jerry T Rahll



**AKM ENAYET ULLAH**  
**PRIMARY EXAMINER**